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ABSTRACT

The role of telecommunications in establishing the electronic classroom in distance education is illustrated. Using a computer-based doctoral program and the UNIX operating system as an example, how a personal computer and modem may be combined with a telephone line for instructional delivery is described. A number of issues must be addressed in the design of such distance education. The spectrum of use and the question of learner "seat time" must be addressed. Instructor "high touch" attention to students and the compatibility of hardware and software are other questions that must be answered. At Nova University (Florida), students from 26 different states are conducting online work in conjunction with regional seminars. It is evident that a trend has begun, at both the elementary and secondary levels as well as in higher education, toward the electronic classroom. (SLD)

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"THE ELECTRONIC CLASSROOM"

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January 31, 1985

A presentation on the use of telecommunications and electronic technology in tomorrow's learning environment.

Prepared for the 5th Annual Florida Instructional Computing Conference at Orlando, Florida, January 28-31, 1985.

ABSTRACT: The role of telecommunications in establishing the "electronic classroom is illustrated in this presentation. Using a computer-based doctoral program and the UNIX* Operating System as an example, the presenters describe and demonstrate how a personal computer and modem may be combined with a telephone line to enable an individual learner of any age to become part of a total electronic learning network.

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THEORETICAL BACKGROUND FOR THE ELECTRONIC CLASSROOM

A. INTRODUCTION

Education is defined by the World Book Encyclopedia as the process by which people acquire knowledge, skills, habits, values, and/or attitudes. Therefore, education involves both learning and teaching. A rich area for educational researchers has been that of comparing various teaching strategies. Unfortunately, we have had limited success in identifying one method that works better, consistently, then any other methods. Most of the changes that have occurred have been more in form then in substance. In fact, we do not use significantly different methods today then were used in our early history. Children in prehistoric times learned to hunt and survive by using adults as role models. Education became somewhat more formalized around 300 B.C. when writing was invented in both Summaria and Egypt. While working the fields, youngsters had little time to learn to read and write. Teachers generally were limited to teaching orally what they had memorized. With the advent of writing, special schools were established where the future scribes could learn by a "new method" - copying the same literary passages over and over. They then learned arithmetic by copying business accounts. Today's western educational system is based upon the ancient Greek model. In Athens, a slightly different process was utilized. The family slave took the young boy from teacher to teacher for the various subjects to be learned. It was assumed that girls learned all they needed to know from their mothers. In the Greek culture, young boys were assigned to an older Greek with the hope that the young male would want to imitate his companion and take on his virtues and knowledge.

The first modern universities began as collections of scholars into guilds. Southern universities were modeled after the University of Bologna - that began as a law school in the 1000's. It was here that our tradition of lecturing probably bagan in earnest. The lack of textbooks led to the educational process of memorizing the material read to them by the professor in class. This technique may still be observed in some forms in today's classrooms.

Work with learning theories has led us to provide a variety of instructional strategies and media for today's students in many classrooms. The blackboard, overhead projector, movie and slide projectors, and the television have all enriched our teaching and presentation of stimulus material. We do know that students learn more as they become actively involved in the learning process rather than sitting as passive listeners.

The latest addition to this array of media has been the personal computer. Until the introduction of the microcomputer, the role of the teacher has still relied heavily upon the trusted method of "tell and tell." Lecturing may have been a satisfactory method for transmitting knowledge in the past but it will not serve tomorrow's graduate very well. With the information explosion, one individual cannot possibly memorize all that is needed. Our schools will better prepare the graduates of tomorrow by helping them master the processes they need to use to cope with change. Students need to learn how to locate and access information that is relevant to their tasks and to be able to manipulate that data so they can make decisions upon incomplete information.

The microcomputer is a tool that can help connect the learner into a vast network of data and an efficient operating system can enable the learner to manipulate that information as desired. Many individuals have already started using such services as Compuserve and The Source to work online with information banks and to communicate, electronically, with other people. The schools must tap into this resource or the commercial interests will direct us into ways to use it. If we look ahead now and begin to prepare ourselves for a role in the information age, we will be able to help direct the use of new technology and guide the introduction of new methods into our classrooms - the elctronic classrooms of tomorrow.

Popular futurists, such as Alvin Toffler and John Naisbitt, have let the world know that we are on the crest of the third major wave of social change. Our world will change more rapidly during this generation than at any time in the past. We have tremendous leverage at this point in history if we care enough to work at it. Will the predictions for the establishment of the "electronic cottage" come true? At the January, 1985 annual conference of the Association for Educational Communications and Technology, John Naisbitt spoke on the future of this concept. His current opinion is that the prediction of an electronic cottage will not occur as expected in the world of business. He believes that people want to congregate for social interaction too much to stay at home to work - even though the technology makes it possible. He went on to add that the schools will see increased use of electronic home study because of economic necessity coupled with the pedagogical advantages. Youngsters must master the techniques and thought processes required to access, manage and interpret voluminous information rapidly and accurately.

B. SPECTRUM OF USE

Where do you place yourself on the spectrum related to the educational use of electronic communication technology? Do you believe that youngsters should be able to use computers and modems (i.e. devices to connect the computer to the local phone line) to do their school work both at home and at school? Are they tools that should be learned "about" rather than "with?" Is it fair to let students use computers in doing their homework? Will you accept papers prepared on a word processor? Other than the higher quality of product, how do you even tell the difference - unless the student right justifies the type or uses a low quality printer?

Where do you place yourself on a scale of 1 to 10 in terms of your belief about the use of electronic technology and telecommunications in the classroom of tomorrow?

THE SPECTRUM OF MULTI-USER,
MULTI-TASK NETWORKING

CIRCLE: 0 1 2 3 4 5 6 7 8 9 10

No Usage Predicted — Heavy Usage Forecast

C. SEAT TIME

How does one instruct using electronic technology in the educational setting? Is it still appropriate to gather groups of youngsters and tell them information while they plug in their computers to see what you mean or to try out what you describe? Or do children wake up and go to their desks where they call up their teacher for a lesson when they are ready? We are somewhat naive if we believe that we can open school next year, hand each child or adult learner a personal computer and modem and expect them to rush home to plug in and sign on so they can get right down to learning alone. The teacher will always be an important element in the educational process. This will include traditional teaching as well as managing and directing. The great advantage may be that youngsters will be able to receive greater individualization in their assignments and feedback and the teacher will not feel so overburdened.

Once learners are not required to spend all of their formal learning time in a "seat" in school, how will accrediting agencies evaluate programs? Perhaps even greater emphasis will be placed upon outcomes measures than the process used. Carnegie units, VA forms, NCATE approval and other agencies will also have to gear up to deal with this changing world.

We may also need to question how we determine if students are actually the ones connected to the computer - are they doing their own work? As the papers have made clear, there is usually an agency around each major college and university that will be happy to prepare a term paper for you and to guarantee that it wasn't submitted at your particular school in the past four years. Quality checks and security are problems that have always been with us. We must be concerned with such questions as well as test security of online tests, online grades and records, and protection from the hackers.

D. HIGH TOUCH

The expression, "High Tech, High Touch" introduced by John Naisbitt, clearly illustrates the response of society to increasing levels of high technology. We react by seeking greater attendance at movie houses, TA groups, and other forms of human touch. In the educational setting, we must also provide opportunities for such "high touch" on a regular basis. Mixing with a teacher and classmates is an important part of the educational process and should not be ignored. The need for high touch should not be used as an excuse to rationalize our avoidance of the new technology or we will have erred in the opposite direction. We must help achieve a balance of high tech - high touch!

E. COMPATABILITY

As a nation, we do not like to be told that we must all do things the same way. As consumers we want to be able to select the computer and equipment we want to use. Once the decision is made to interconnect users at home and in the schools, there must be ways to incorporate a variety of makes and brands. Users will want to be able to connect to all three - the home, the school, and outside services. There are some businesses and schools using local area networks (LAN) to connect multiple users. However, all users have the same type of machine and they are connected only to a preset group. Services for a fee, such as MCI Mail or CompuServe are a step in this direction. Still needed is the organized approach to education taking advantage of these new tools.

Selection of a central computer and flexible operating system to control the input and output of a variety of makes and models is a key to the success of any venture to bring electronics into the actual operation of the classroom.

F. CONCISENESS

No matter how it is developed, online communication is expensive and this leads to a need for brevity. Clear, concise articles and papers will become even more important. We seldom teach these skills but we should. It will now make good economic sense to spend some additional time teaching students how to write well.

Who will pay for these new services? Will they be limited to the wealthy? Will information access become a national resource and be made available to all as we have with public libraries?

Since it is cheaper to work on papers, information, etc. while not connected to a central computer, the offline time becomes important. This means that we must insure that we help students acquire good word procesing abilities. We may become a nation of clerks or we may develop the clerical skills needed to handle these new tools as second nature so we can conentrate on the manipulation of the data. We will also seek faster modems so we can send and receive information more rapidly. The current 300 baud modems (300 characters per second) are rapidly being replaced by 1200 baud modems. The promise of inexpensive 2400 baud modems is in the near future.

G. APPLICATIONS

Obviously, telecommunications allows learners to sit at home and receive instruction, obtain assignments, complete online CAI lessons, communicate by electronic mail with their instructor, classmates and others online. This communication may be in real time (as on a telephone) or by leaving messages so each may respond at their convenience.

We can move into this environment rapidly or take our time and feel our way. The establishment of the "Electronic University" and "Telelearning" have already provided us with a national network for non-credit offerings. They each promise credit courses in the near future. We could even offer entire years of schooling or degree programs using this medium if we construct it carefully and monitor its quality.

We believe that the first application will be for a "Homework Hotline." Students will attend school as usual but at night they can call into the Hotline for answers to questions, for additional programmed lesson material, for online conferences to discuss the implications of the topic, etc. Instructors can both receive and answer questions and monitor the various conversations and discussions so he/she has a better feel for the student's progress. 7

A second area of applications is in the correcting and grading of student work. When papers are submitted online, modern operating systems contain tools or utilities that will assist in such grading. This can lead to help with the improvement of writing skills. The same tools that help instructors evaluate written work can be used as the basis for a writing course. A few universities (Colorado, Nova, etc.) are already offering such courses. There are also utilities to help us use statistics to collect and analyze data from our testing and from surveys. Data is easy to work with once it is online and can be sent to various programs for analysis and reporting.

It is in the area of communications where the greatest impact of the electronic revolution will be seen. Communications between the home, the student and the teacher will be vastly improved. Current information can easily be shared and interested parents and students can always be aware of the learner's progress and needs.

H. STAFFING

An interesting question that begins to emerge is "Are electronic faculty different from traditional faculty?" Will these faculty have to be treated and paid differently then the norm? When and how will educators be trained for these new roles? Will new administrators be needed? Will we want an "Assistant Principal for Home/School Interfacing?"

I. THE FUTURE

Although we lack a reliable crystal ball, it seems evident that a trend has begun. Electronic classrooms are already in existence. Soon a lab school with fully electronic classrooms will be announced somewhere and we will see the acceptance of varoius aspects of these experiments in our public schools. Within two to five years, many districts and colleges should have "Homework Hotlines" established to supplement the regular school activities. The current use of LANs will probably be expanded and modems will be commonplace as accepted pieces of school equipment. Students may be able to bring their disks to school to input their assignments directly into the school computer until they purchase their own telecommunication system. We will see a variety of approaches attempted and a number of failures and successes. The best part of all this is that we are again interested in improving the educational process. We will see enthusiasm and arguments, discussions and demonstrations. Most of all, we hope we will see students better able to cope with the world of tomorrow because of the electronic classrooms we are going to help create.

INTRODUCTION

An example of an "electronic classroom" that would rate a 9+ on the spectrum of use of electronic technology and telecommunications in the classroom can be found in any of the three doctoral programs in Nova University's Center for Computer Based Learning. The three programs operating from this center are the Doctor of Arts in Information Science (DAIS), the Doctor of Arts in Training and Learning (DATL), and the Doctor of Education in Computer Education (CED). All three programs depend heavily on the use of microcomputers, modems and the entire telecommunication system in conjunction with the UNIX* Operating System running on a Vax 11/780. Students from 26 different states, including Alaska, conduct their online classwork in conjunction with regional seminars. Approximately 80% of the effort expended by each student is done on the microcomputer, either online using UNIX* to communicate with Nova, online using the tools of UNIX* to accomplish their coursework, or offline using a wordprocessor and other writing tools to complete their papers and assignments.

During the presentation, examples from the Nova doctoral programs will be described in each of the following areas.

		EXAMPLES
o SPECTRUM		
1)	SEAT TIME	resources used (ru)
2)	HIGH TOUCH	seminars who talk mail online conferences finger
3)	COMPATIBILITY	whohas
4)	CONCISENESS	wwb
5)	APPLICATIONS	learn (CAI) "Hotline" ed said s
o STAFFING		
o THE FUTURE		